

## ABSTRACT OF THE DISCLOSURE

Compositions and methods for treating wounds to significantly reduce the healing time, reduce the incidence of scar formation, improve the success of skin grafts, reduce the inflammatory response and providing anti-bacterial treatments to a patient in need thereof, that include small non-interlinked particles of bioactive glass or highly porous bioactive glass, are disclosed. Anti-bacterial solutions derived from bioactive glass, and methods of preparation and use thereof, are also disclosed. The compositions include non-interlinked particles of bioactive glass, alone or in combination with anti-bacterial agents and/or anti-inflammatory agents. The compositions can include an appropriate carrier for topical administration. Anti-bacterial properties can be imparted to implanted materials, such as prosthetic implants, sutures, stents, screws, plates, tubes, and the like, by incorporating small bioactive glass particles or porous bioactive glass into or onto the implanted materials. Anti-bacterial properties can also be imparted to devices used for *in vitro* and *ex vivo* cell culture by incorporating non-interlinked particles of bioactive glass into the devices. Anti-bacterial compositions derived from aqueous extracts of bioactive glass are also disclosed. These compositions can be used, for example, in food preparation, solutions used for cell culture, and buffer solutions, such as i.v. solutions.

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